IN THE CLAIMS

1. (currently amended) A reactor for treating a substrate comprising:

a reaction chamber;

a substrate carrier mounted within the ~~reactor~~ reaction chamber for rotation about an axis, whereby at least one substrate can be mounted on the substrate carrier; wherein said substrate carrier has a treatment surface substantially perpendicular to said axis, said treatment surface incorporating a plurality of zones of unequal area;

a plurality of gas inlets connected to said chamber;

one or more sources of a reactant gas connected to said inlets and one or more sources of a carrier gas connected to at least one of said inlets, said gas sources and said inlets being constructed and arranged so that each inlet directs a gas stream into said chamber toward said substrate carrier in a flow direction substantially parallel to said axis of rotation of said substrate carrier, said inlets being arranged so that each said gas stream impinges on a different one of said zones of said treatment surface; wherein the one or more sources of reactant gas and the one or more sources of carrier gas are configured such that the streams directed by said inlets ~~having~~ have different concentrations of said reactant gas and different mass flow rates of said reactant gas but ~~having~~ have substantially the same velocity~~; and said inlets and said gas sources are arranged so that the reactant gas mass flow rate of each gas stream is proportional to the area of the associated zone of said treatment surface~~.

2. (canceled)

3. (currently amended) A reactor as claimed in claim ~~2~~ 1 wherein said inlets and said gas sources are arranged so that a first one of said gas streams impinges on a first one of said zones having a first area, a second one of said gas streams impinges on a second one of said zones having a second area greater than said first area, and wherein the one or more sources of reactant gas and the one or more sources of carrier gas are configured so that said second one of said gas streams

has a reactant gas mass flow rate greater than the reactant gas mass flow rate of said first gas stream.

4. (currently amended) A reactor as claimed in claim ~~2~~ 1 wherein ~~said inlets and~~ said gas sources are ~~arranged~~ configured so that the reactant gas mass flow rate of each gas stream is ~~directly~~ substantially proportional to the area of the ~~associated~~ zone of said treatment surface ~~while constant total gas velocity is maintained~~ upon which each gas stream impinges.

5. (canceled)

6. (currently amended) A reactor as claimed in claim ~~5~~ 1 wherein said inlets are disposed at differing radial distances from said axis.

7. (original) A reactor as claimed in claim 6 wherein said inlets are arranged to direct said gas streams substantially along a common plane, said common plane extending substantially radially from said axis.

8. (original) A reactor as claimed in claim 1 further comprising an injection plate having upstream and downstream faces, said injection plate being at least partially porous, said injection plate being disposed in said chamber between said inlets and said substrate carrier with said upstream face facing said inlets so that gasses passing from said inlets to said substrate carrier pass through said injection plate to said downstream face and from said downstream face toward said substrate carrier.

9. (original) A reactor as claimed in claim 8 wherein at least one of said inlets includes a reaction gas port connected to one of said one or more reaction gas sources and a carrier gas port connected to one of said one or more carrier gas sources, said ports opening to said chamber so that reactant gas introduced through said reactant gas port and carrier gas introduced through said carrier gas port mix and form a combined gas stream exiting from said downstream face of said injection plate.

10. (original) A reactor as claimed in claim 1 wherein at least one of said inlets includes a common port opening to said chamber and connected to one of said one or more

reaction gas sources and also connected to one of said one of more carrier gas sources.

11. (currently amended) A reactor for treating a substrate comprising:

a chamber;

a substrate carrier mounted for rotational movement about an axis within the chamber, said substrate carrier being adapted to hold one or more substrates; and

a gas stream generator arranged to ~~deliver~~ direct a gas stream within the chamber toward the substrate carrier in a direction substantially parallel to said axis, said gas stream generator being configured such that the gas stream has ~~having~~ substantially uniform velocity but different concentrations of a reactant gas at different radial distances from said axis.~~locations within the stream, said gas stream generator being arranged to direct the gas stream within the chamber toward the substrate carrier;~~

~~said substrate carrier is mounted for rotational movement about an axis and said gas stream generator is adapted to supply said gas stream with different concentrations of said reactant gas at different radial distances from said axis.~~

12. (original) A reactor as claimed in claim 11 wherein said gas stream generator is adapted to supply said gas stream with concentrations of said reactant gas at a rate directly proportional to the radial distances of said gas stream generator from said axis.

13. (canceled)

14. (original) A reactor as claimed in claim 11 wherein said gas stream generator includes a plurality of gas stream inlets spaced apart from one another and different gas sources connected to said gas stream inlets, said gas sources being arranged so that gases supplied through different inlets have different concentrations of said reactant gas while maintaining substantially constant total gas velocity.

15. (original) A reactor as claimed in claim 11 wherein said gas stream generator includes a structure defining a carrier gas passage having a downstream direction and a

reactant gas passage having a downstream direction, said reactant gas passage extending in proximity to said carrier gas passage, a source of carrier gas communicating with the interior of the chamber through said carrier gas passage so that carrier gas entering the chamber will pass in the downstream direction through the carrier gas passage, and a source of reactant gas communicating with said chamber through said reactant gas passage so that reactant gas entering the chamber will pass in the downstream direction through the reactant gas passage, each said passage having resistance to gas flow in the downstream direction through the passage, the resistance of the carrier gas passage increasing progressively in a radially outward direction away from said axis, the resistance of the reactant gas passage decreasing progressively in the radially outward direction.

16. (original) A reactor as claimed in claim 15, further including a choke structure comprising a plate, wherein said carrier gas passage is in the form of a carrier gas slot extending through said plate, said reactant gas passage is in the form of a carrier gas slot extending through said plate, said each said slot having a width transverse to the radially outward direction, the width of the carrier gas slot decreasing progressively in the outward direction, the width of the reactant gas slot decreasing progressively in the inward direction.

17. (currently amended) A reactor for growing epitaxial layers on a substrate comprising:

a reaction chamber;

a substrate carrier movably mounted within the reactor chamber for rotation about an axis, whereby at least one substrate can be mounted on the substrate carrier; <u>wherein said substrate carrier defines a treatment surface adapted to hold said one or more substrates thereon;</u>

a first reactant gas source for supplying a first reactant gas at a first reactant gas flow rate;

a first carrier gas source for supplying a first carrier gas at a first carrier gas flow rate;

said first reactant gas ~~inlet~~ source and said first carrier gas source being connected to said chamber so that the first reactant gas and first carrier gas enter the chamber as a first combined gas stream, said first combined gas stream having a first combined stream velocity;

a second reactant gas source for supplying a second reactant gas at a second reactant gas flow rate;

a second carrier gas source for supplying a second carrier gas at a second carrier gas flow rate;

said second reactant gas source and said second carrier gas source being connected to said chamber so that said second reactant gas and said second carrier gas enter said chamber as a second combined gas stream, said second combined gas stream having a second combined velocity substantially equal to said first combined velocity;

said reactant gas sources and carrier gas sources being connected to said chamber so that said first and second combined gas streams are directed towards said substrate carrier in a direction substantially parallel to said axis, said first combined gas stream ~~impinges~~ impinging on a first treatment area of said treatment surface, and said second combined gas stream ~~impinges~~ impinging on a second treatment area of said treatment surface, said second treatment area unequal in area to said first treatment area; and

said ~~first and second reactant gas velocities being selected~~ reactant gas sources and said carrier gas sources being configured so that a ratio of said first reactant gas flow rate to said first treatment area is substantially equal to the ratio of said second reactant gas flow rate to said second treatment area.

18. (canceled)

19. (currently amended) A reactor for treating a substrate, comprising:

a chamber;

a substrate carrier rotatably mounted in said chamber for rotation about an axis, said substrate carrier including a

treatment surface for holding one or more substrates to be treated; and

gas supply means for introducing a reactant gas and a carrier gas into said chamber in a direction substantially parallel to said axis so that said gases flow within said chamber toward said treatment surface in one or more streams ~~at~~ having substantially uniform velocity but so that different portions of said treatment surface at different radial locations receive substantially the same amount of said reactant gas per unit time per unit area;

wherein said gas supply means is operative to mix at least some of said reactant gas with said carrier gas so that gas flowing toward radially outward portions of said treatment surface has a higher concentration of said reactant gas than gas flowing toward radially inward portions of said treatment surface.

20. (canceled)

21. (currently amended) A method of treating substrates comprising:

rotating a substrate support in a chamber about an axis while supporting one or more substrates on said support so that one or more surfaces of the substrates to be treated lie substantially perpendicular to said axis; and

introducing a ~~reactant gas and a carrier gas~~ plurality of gas streams into said chamber in a direction substantially parallel to said axis, each of said gas streams ~~so that said gases flow~~ flowing within said chamber toward said one or more surfaces ~~in one or more streams having~~ with a substantially uniform velocity; ~~at different radial distances from said axis so that different portions of said one or more surfaces at different radial distances from said axis receive substantially the same amount of said reactant gas per unit time per unit area; and,~~

mixing ~~at least some of said~~ a reactant gas with ~~said~~ a carrier gas to form each of the plurality of streams, the gases being mixed such that the gas streams ~~so that gas~~ flowing toward radially outward portions of said one or more surfaces

~~has~~ have a higher concentration of said reactant gas than the gas streams flowing toward radially inward portions of said one or more surfaces.

22. (currently amended) A method as claimed in claim 21 wherein said introducing step includes discharging said ~~gases~~ gas streams into said chamber through a plurality of inlets disposed at different radial distances from said axis.

23. (currently amended) A method as claimed in claim 22 wherein said mixing step is performed so ~~that~~ as to mix the carrier gas with the reactant gas prior to discharge from at least some of said inlets, and so that streams having different concentrations of said carrier gas will be discharged from different ones of said inlets.

24. (original) A method as claimed in claim 21 further comprising the step of maintaining reaction conditions in said chamber such that said reactant gas reacts at said substrate to grow a layer including a constituent derived from said reactant gas epitaxially on said one or more surfaces.

25. (original) A method as claimed in claim 24 wherein said reactant gas includes a metal alkyl.

26. (original) A method as claimed in claim 24 wherein said carrier gas includes nitrogen.

27. (new) A method as claimed in claim 23 wherein said mixing step is performed so that the concentration of reactant gas in each stream is substantially proportional to the radial distance of the stream from said axis.

28. (new) A method as claimed in claim 22 wherein said mixing step is performed so as to mix the carrier gas with the reactant gas just after discharge from at least some of said inlets, so that streams having different concentrations of said carrier gas will flow within said chamber toward said one or more surfaces.

29. (new) A method as claimed in claim 28 wherein said chamber further comprises a porous injection plate disposed between said inlets and said substrate support, said porous injection plate having a downstream face facing said substrate support, and wherein said mixing step is performed so that

streams having different concentrations of said carrier gas exit from said downstream face of said injection plate and flow toward said one or more surfaces.

30. (new) A method as claimed in claim 21 wherein said reactant gas and said carrier gas are mixed such that different portions of said one or more surfaces at different radial distances from said axis receive substantially the same amount of said reactant gas per unit time per unit area.